

DIVISION 5 - METALS

SECTION 05500

MISCELLANEOUS METALS

PART 1 - GENERAL

1.1 SCOPE

- A. The Contractor shall furnish and install all miscellaneous metals and materials necessary to complete the work shown on the drawings of specified herein. The miscellaneous metals and materials shall be as hereinafter described.
- B. All items which are to be built into the structures shall be furnished as required during the course of the work. Casting or fabrication of the items shall be true to pattern, dimensions, and details shown on the drawings. No plugging or filling will be allowed. Standard commercial products will be acceptable subject to approval of the Engineer. Welding shall be continuous along entire lines of contact, except where tack welding is called for. Welding shall be in accordance with the current applicable code of the American Welding Society. All metal shall be new and free from mill scale, rust, or pitting.

1.2 SHOP DRAWINGS

- A. Submit shop drawings to Engineer for approval of all miscellaneous items. Obtain approval of drawings prior to proceeding with manufacturing. Shop drawings shall indicate the fabrication, assembly, and erection details; sizes of all members; fastenings, supports and anchors; patterns; clearances; and all necessary connections to work of other trades.

1.3 COMPLIANCE WITH STANDARD AND INDUSTRY SPECIFICATIONS

- A. Any material or operation specified by reference to the published specifications of a manufacturer, the American Society for Testing and Materials (ASTM), the American Iron and Steel Institute (AISI), the American Institute of Steel Construction (AISC), the American Hot Dip Galvanizers Association (AHDGA), the American Welding Society (AWS) or other published standard, shall comply with the requirements of the current specifications or standard listed. In case of a conflict between the referenced specifications and the project specifications, project specifications shall govern, unless written approval is obtained from the Engineer.

- B. The minimum standard for the design, supply, and fabrication of handrails, gratings and ladders, shall satisfy all requirements of the Williams-Steiger Occupational Safety and Health Act of 1970 and subsequent amendments.

1.4 WORKMANSHIP

- A. Metal Surfaces: Metal surfaces shall be clean and free from mill scale, flake, rust and rust pitting; well formed and finished to shape and size, with sharp lines and angles and smooth surfaces. Shearing and punching shall leave clean true lines and surfaces. Weld or rivet permanent connections. Welds and flush rivets shall be finished flush and smooth on surfaces that will be exposed after installation. Do not use screws or bolts where they can be avoided; where used, heads shall be countersunk, screwed up tight and threads nicked to prevent loosening.
- B. Casting shall be of uniform quality, free from blowholes, porosity, hard spots, shrinkage distortion or other defects. Castings shall conform to the dimensions indicated with a tolerance of plus or minus 1/8 inch, except in the dimension of covers and the openings to receive them shall be limited to plus or minimum 1/16 inch. Castings shall be smooth and well cleaned by shot blasting or other approved method. Covers subject to street or foot traffic shall have machined horizontal bearing surfaces: provide machined bearing or contact surface for other joints where indicated or required.
- C. Fastenings shall be concealed where practicable. Thickness of metal and details of assembly and supports shall give ample strength and stiffness. Joints exposed to weather shall be formed to exclude water. Provide holes and connections for the work of other trades.
- D. At proper time, deliver and set in place items of metal work to be built into adjoining construction.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel Castings: Steel castings which conform to Federal Specification QQ-S-681, "Steel Castings," except that repairs to castings shall not be made without the knowledge and prior approval of the Engineer. Minor surface imperfections not affecting the strength of castings may be welded in the "green" if approved by the inspector. Surface imperfections shall be considered minor when the depth of the cavity prepared for a welding is not greater than 20 percent of the actual wall thickness, but in no case greater than 1 inch. Defects other than minor surface imperfections may be welded only when specifically authorized in accordance with the following requirements:

1. The defects have been entirely removed and are judged not to affect the strength, use, or machinability of the castings when properly welded and stress relieved.
 2. The proposed welding procedure, stress relieving and method of examination of the repair work have been submitted and approved.
- B. Cast Iron: Cast iron shall be gray cast iron conforming to ASTM A48, and shall be class 30 unless otherwise required.
- C. Aluminum: Aluminum shall be mill finished unless otherwise specified. All aluminum surfaces in contact with concrete, mortar, or dissimilar metals shall be thoroughly protected in a heavy coating of bituminous paint, or other approved insulating materials.
- D. Bolts and Nuts: Bolts and nuts shall conform the Federal Specification FF-B-575, for "Bolts, Hexagon and Square." Bolts and nuts shall be hexagon type, stainless steel bolts, nuts, screws, washers, and related appurtenances shall be equal to ASTM A167, type 316.
- E. Expansion Bolts: Expansion bolts shall be Cinch (type 38) Ackerman Johnson (screw anchor), Diamond (caulking anchor, Phillips Red Head (concrete anchor) or equal.
- F. Toggle Bolts: Toggle bolts shall be Diamond, Keystone, Star, or equal.

2.2 ALUMINUM ACCESS FRAMES AND COVERS

- A. The vault access frames and covers shall be provided by the precast concrete supplier in accordance with Specification Section 03410, Paragraph 2.13.B.

2.3 MISCELLANEOUS STRUCTURAL ALUMINUM

- A. Miscellaneous structural aluminum: Of sizes and/or shapes shown and of 6061-T6 aluminum alloy conforming to "Standards for Aluminum Mill Products," of Aluminum Association. Paint all aluminum surfaces coming into contact with dissimilar surfaces with an approved bituminous paint.

2.4 SUPPORTS, ANCHORS, AND MISCELLANEOUS FASTENERS

- A. Required anchors, couplings, bolts, and nuts required to support miscellaneous metals work: Furnished and installed as required. Materials shall be as specified

hereinbefore. All bolts, nuts and anchors submerged in or exposed to raw sewage shall be Type 316 stainless steel. All other bolts, nuts, and anchors shall be galvanized mild steel, except that bolts, nuts, anchors and angles connecting stainless steel or aluminum to any other surface shall be of Type 316 stainless steel.

2.5 ALUMINUM PROTECTION

- A. Where aluminum is fastened to steel, stainless steel bolts with neoprene washers shall be used.

2.6 ALUMINUM VERTICAL LADDER

- A. Vertical ladder shall be as manufactured by Washington Aluminum Company, Baltimore, Maryland or equal. Ladders shall have 2-1/2" x 3/8" stringers with 15/16" square non-slip rungs spaced at 12" on center. Ladders shall be aluminum alloy 6061-T6. All necessary anchor bolts will be stainless steel and furnished with ladder. All material will have a standard mil finish. The portion of the ladder in contact with concrete shall have a heavy shop coat of bituminous paint.
- B. Safety Extensions: Safety extensions shall be as manufactured by Washington Aluminum Company, Baltimore, or equal. Extension poles shall be aluminum alloy 6061-T6 and castings shall be aluminum alloy 356-T6. All necessary hardware will be stainless steel and furnished with safety extensions for mounting to ladder. All material will have a standard mil finish.

2.7 STAINLESS STEEL OVERFLOW WEIR

- A. Provide one fabricated stainless steel overflow weir assembly in the leachate influent manhole complete as shown on plan sheet M-01. Stainless steel shall be Type 304 or 310. Field verify the depth of the existing manhole and all manhole dimensions prior to fabrication and shop drawing submittal.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Where aluminum materials (not protected with factory applied baked enamel or equal) comes in contact with dissimilar metals, a heavy bodied bituminous paint or insulating tape shall be applied between the aluminum and the dissimilar metals.
- B. Verify all measurements in the field.
- C. Deliver to Contractor all anchor bolts and plates required for the installation of

miscellaneous metal products to be set in concrete or in masonry in ample time for installation with templates and/or instructions for setting.

3.2 INSTALLATION

- A. Common unfinished bolts shall have shanks of proper length to provide full grip. Provide approved lock washers to prevent slipping of nuts.
- B. All welding shall conform to the Code for Arc and Gas welding in Building Construction of the American Welding Society. All welding shall be performed by operators certified in accordance with this Code.
- C. Finished members shall be true to line and free from twists, bends and open joins between component parts. If straightening or flattening is require, it shall be done in a manner that will not injure the material.

END OF SECTION